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A REVISION OF THE VERNAL SPECIES OF HELENIUM (COMPOSITAE)¹

HOWARD F. L. ROCK

In the year 1818, Thomas Nuttall established the genus *Leptopoda* (Gen. N. A. Pl. 2: 174.) which was based on a *Helenium*-like plant, *Leptopoda Helenium* Nutt., from South-eastern United States. The genus, so named "in allusion to the elongated peduncle" was distinguished from *Helenium* by the neutral and sterile ray florets and by the awnless pappus scales which numbered more than five per achene. In addition, Nuttall distinguished *Leptopoda* from both *Gaillardia* Fougx. and *Balduina* Nutt. on receptacular features. The receptacle in *Leptopoda* is naked, in contrast to the appendaged nature of the receptacle in both *Gaillardia* and *Balduina*. For these four genera, *Helenium*, *Leptopoda*, *Gaillardia*, and *Balduina*, plus *Actinella* Juss. ex Nutt., Nuttall proposed the name GALARDIAE (l. c.) which he offered as a "very natural group of genera."

The genus *Leptopoda* is not recognized in the current taxonomic treatments and literature, but, instead, the species formerly placed in *Leptopoda* now reside in the genus *Helenium*. This species-group is presently acknowledged to be a portion of the genus *Helenium* that is characterized by the perennial, vernal-flowering habit, the neutral and sterile rays and a geographic distribution of the species-group that is confined to southeastern United States. A revisional study of the genus *Helenium* by the author has revealed that the problems involved are not only confined to those associated with specific or subspecific

¹ A portion of a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Graduate School of Arts and Sciences, Duke University.

taxa. Indeed, the generic limits of *Helenium* have been amplified by the inclusion of so many diverse species-groups that the genus threatens to ultimately encompass a goodly portion of the subtribe HELENIINAE, especially parts of the TETRANEURANAE and GAILLARDIANAE as recognized by Rydberg (N. A. Fl. **34** (2): 100-140. 1915.) The present revision, then, is part of the larger revisional study pertaining to the genus *Helenium*, excluding, for the present, that portion of the genus (*Cephalophora* Cav. and *Actinea* Juss.) which occurs in South America.

HISTORICAL ACCOUNT

Although the formal history related to *Leptopoda* began with Nuttall's description of the genus in 1818 (l. c.), at least one species of the vernal portion of *Helenium* was known prior to that date. Thomas Walter, in his *Flora Caroliniana* of 1788, described the species *Helenium vernale* (cf. RHODORA **58**: 311-317. 1956.) Fifteen years later, in 1803, Michaux, either unaware of Walter's *Flora* or else ignoring it, redescribed *Helenium vernale* (in part) as *Galardia fimbriata* (Fl. Bor.-Am. **2**: 133.) Michaux's collection of *Galardia fimbriata*, at the Muséum National d'Histoire Naturelle in Paris reveals, however, that he had utterly confused two vernal species of *Helenium*; *Helenium vernale* Walt. and *H. pinnatifidum* (Nutt.) Rydbg. (a species that was to be described later as *Leptopoda puberula* Macbride in Ell.). The annotations and labels by Michaux that accompany the mixed specimens included on the type sheet, as well as the published description, indicate clearly that Michaux made no distinction between the two elements. Michaux's *Galardia fimbriata* can only be considered as a binomial which encompasses the two species *H. vernale* and *H. pinnatifidum*. At the time that Nuttall established *Leptopoda* and described *L. Helenium*, he made no reference to Walter, though *L. Helenium* is a synonym of *H. vernale*. He did cite Michaux's *G. fimbriata* with a query. At the same time, Nuttall observed that *Leptopoda* was "A genus much more nearly allied to *Helenium* than *Galardia*, but connecting both."

James Macbride, the collaborator with Elliott, was the first to make the distinction between the two confused species. In Elliott's Sketch (Bot. S. C. & Ga. **2**: 445. 1823), these dis-

tinctions are clearly drawn, together with pertinent observations made on the two species by Macbride in field studies. The final result was that Macbride renamed Nuttall's *L. Helenium* as *L. decurrens* and described the second species as *L. puberula*, mis-identifying it with Walter's *H. vernale* and incorrectly deciding that it was completely equivalent to Michaux's *G. fimbriata*.

During the interval between Elliott's *Sketch* and Nuttall's renewed activity with the genus, Cassini maintained *Leptopoda* in his various works and was in agreement with Nuttall's proposal of the group of related genera, the GALARDIAE. Lessing affirmed the position taken by both Nuttall and Cassini. Fortunately, Rafinesque did little during this period to complicate matters. He published an illegitimate, substitute name for the genus, *Leptophora* (Am. Mo. Mag. Crit. Rev. 4: 195. 1819)—misprinted as *Leptocarpha* by Endlicher (Gen. p. 1383. 1841)—and described the species *Helenium flexuosum* (New Fl. N. A. (part 4): 81. 1836) which has proved to be both valid and legitimate. In 1841, Nuttall described three more species of *Leptopoda*, making no mention of either Macbride or Elliott, although A. P. DeCandolle had clearly cited Macbride and Elliott in the treatment of *Leptopoda* prepared for the Prodrômus (5: 653. 1836.) In the same article (Trans. Am. Phil. Soc. ser. 2. 7: 372-373, 384-385), Nuttall described two additional species, *H. nudiflorum* and *H. micranthum*. However, both of these species are conspecific with Rafinesque's earlier *H. flexuosum*. Again, as in the case of Macbride and Elliott, Nuttall made no mention of Rafinesque. The lack of any published consideration by Nuttall concerning the work of others has increased the synonymy unduly and has often resulted in a confused application of the binomials involved.

The appearance of Torrey and Gray's *Flora of North America* (1: 386-388. 1842) provided the first comprehensive account of the genus *Leptopoda*. In this account, they recognized six species and two varieties. Three of the species and one of the varieties they described as new, although one of the species, *L. brachypoda*, was described as new in order to accommodate the transfer of Nuttall's *Helenium nudiflorum* to the genus *Leptopoda*. They attempted to straighten out the complicated synonymy of the species and in many ways succeeded, even

though they were to provide a further complication by picking up the epithet *fimbriata* for a species of *Leptopoda* from Texas, asserting that it was probably not the same as Michaux's *Galardia fimbriata*.

There was a lull in the events related to *Leptopoda* until 1870. In that year, Alphonso Wood (Am. Bot. & Fl. 180. 1870.) transferred the species of *Leptopoda* to *Helenium*, formulating the Section LEPTOPODA for the former species of *Leptopoda* and the Section HELENIATRUM for the "pistillate"-rayed species of *Helenium*. Asa Gray, stimulated by what he considered to be a somewhat indiscriminate merging of several genera with *Helenium* by Bentham (Gen. Pl. 2 (1): 1873), presented "An arrangement of the known species . . ." of *Helenium* in 1874 (Proc. Am. Acad. 9: as a footnote beginning on page 202.) In this arrangement, Gray recognized *Leptopoda* as a section of *Helenium* and made the same combinations that A. Wood had made earlier, ascribing the combinations to himself, however, apparently deliberately ignoring Wood's earlier work. Gray's treatment recognized five species and a questionable variety in the Section LEPTOPODA. He described one of these five species as new, *H. Curtisii*, and renamed Nuttall's *L. Helenium* as *H. Nuttallii*. A sixth species, *H. nudiflorum* Nutt., he placed in the Section EUHELENIUM because of the branched habit, despite the neutral and sterile ray florets. For the Synoptical Flora of North America (1 (2): 350-351. 1884), Gray repeated essentially the treatment of the Section LEPTOPODA that he proposed in 1874.

It was not until 1903 that another treatment of *Helenium* which included the neutral-rayed species appeared, even though in 1891, O. Kuntze renamed all the species of *Helenium*, categorically, as species of *Heleniastrium* [Mill.] in an abortive nomenclatorial tiff (Rev. Gen. Pl. part 1: 341-342.) J. K. Small incorporated the description of two new species with his Manual treatment of the genus *Helenium* (Fl. SE. U. S. 1290-1292. 1903.) Small, following the position taken by A. Gray, placed *H. nudiflorum* Nutt. and his two newly described species, *H. polyphyllum* and *H. campestre*, in close alliance to *H. autumnale*. Nevertheless, *H. flexuosum* (incl. *H. nudiflorum* Nutt. and *H. polyphyllum* Small) and *H. campestre* Small have neutral

and sterile ray florets and so must be considered as proper species of the Section LEPTOPODA. P. A. Rydberg's treatment of the Southeastern vernal species of *Helenium* (N. A. Fl. **34** (2): 120–131. 1915) is essentially the same as Small's treatment of 1903 with the exception of two modifications. Primarily, Rydberg recognized that *H. nudiflorum* and *H. campestre* properly belonged with the spring-flowering group of *Helenium* species and secondarily, Rydberg recognized an additional taxon in the spring group for which he revived a Nuttallian epithet. It is to be noted that neither Small nor Rydberg used subgeneric divisions in their treatments of the genus. In the Manual of the Southeastern Flora (1459–1461. 1933), Small repeated his treatment of 1903 with Rydberg's modifications and while he did not recognize formal subgeneric categories he did arrange the species of the genus which occurred in the range of the manual into groups that are perhaps the equivalent of series.

Since the last treatment by Small, an historical account of the vernal species is rather brief. There have been a few shuffles in the nomenclature of the species by Moldenke (Bull. Torr. Bot. Club **62**: 230. 1935; Phytologia **1**: 169. 1935) and the description of an additional pair of species in the *nudiflorum* complex by M. L. Fernald (RHODORA **45**: 494. 1943.)

MORPHOLOGY AND TAXONOMIC CHARACTERS

One of the more apparent morphological observations that can be made concerning the genus *Helenium* (*sensu lato*) is that the species can be placed into two groups immediately on the basis of whether the stem is winged by the decurrent leaf-bases or not. All of the species that are currently placed in *Helenium* can be subjected to this test with the exception of one. This exception is *Helenium scaposum* Britt. As the epithet implies, this species is scapose, and it is endemic to the Isle of Pines, Cuba. The plant rarely exceeds 1 dm. in height and consists solely of a basal, perennial rosette surmounted by a single, monocephalous peduncle. The material available for study of this taxon is quite meagre and invariably consists of plants just beginning to flower so that the more mature floral features are quite unknown and can only be surmised. In the original

description, Britton states that *H. scaposum* is "A plant with quite the floral structure of *Helenium*, but its scapose habit is aberrant, resembling that of some *Tetranneuris* species." At this time, I would like to emphasize the apparent relationship of *H. scaposum* to the TETRANEURANAE of Rydberg and suggest that the most likely affinity of this species is with *Plateilema Palmeri* (A. Gray) Cockerell. However, until further study can be made, particularly with mature plants and greenhouse observation, the transfer of this taxon to any other genus would not seem advisable.

All of the vernal species of *Helenium* fall into the class of those having winged stems. For most of these, the winged nature of the stem does not serve as a useful taxonomic criterion for distinguishing between the various species. However, in one, *H. pinnatifidum*, the winging of the stem does serve as an aid to identification. In this species the winging on the stem is restricted to the mid-cauline leaves only and does not exceed 5 mm. in extent. Nevertheless, the decurrency of the mid-cauline leaf-bases is never completely absent and in no case have all of the mid-cauline leaves of plants in this taxon been observed to be strictly sessile, although uncritical observation might tend to lead to the conclusion that they were amplexicaul.

The characters listed below are those that either have been found very useful in the delimitation of species within the vernal group or else they represent characters that serve to define the group. In any case, the procedure of italicizing the phrases applicable to those characters that serve to distinguish the species has been adopted in the specific description as well as emphasizing the more important of these in the discussions that accompany each species treatment.

DURATION.—All of the vernal species of *Helenium* are perennials, and usually quite evidently so. The mode of perennation is by leafy offsets from the caudex. In those plants originating from achenes, the usual course is the formation of a rosette once the plant becomes established following germination. The succeeding season is usually spent in the rosette stage as well. Occasionally some plants will flower in the second season but the more normal and usual course is for the plant to initiate flowering in the spring of the third season. All of the parts

of the plant above-ground are herbaceous, never becoming woody or persisting in an active stage from one season to the next after once flowering. Occasionally there is a secondary flowering period in the same season. Inasmuch as the species of *Helenium*, like other *Compositae*, are determinate in their apical growth, such secondary flowering as does occur is either from buds that have developed in the cauline leaf axils or else from offshoots at the base of the plant that have developed early enough and under conditions sufficiently favorable for their continued growth and maturation.

HABIT.—There are two general classes of growth-habit in the vernal species. *H. pinnatifidum*, *H. vernale* and *H. Drummondii* (*H. fimbriatum* (Michx.) A. Gray) typify the class in which the plants are usually monocephalous and unbranched. Additional heads may develop from cauline leaf axils, but rarely are there more than two of these additional heads. *H. brevifolium*, *H. campestre* and *H. flexuosum* (*H. nudiflorum* Nutt.) are members of the other class in which the plant is normally branched. Within this second class, two forms may be distinguished. *H. brevifolium* and *H. campestre* are oligocephalous with the pedunculate heads arranged in a corymb-like manner. *H. flexuosum* usually has many small heads and the branching pattern is paniculoid. In the species in which the plants have a branched habit, the degree of branching and the number and size of heads is variable to a certain extent under different ecological conditions, becoming more reduced in the relatively unfavorable types of habitats. For the most part, however, the pattern of branching and the inflorescence system, even when more or less variable, are helpful in distinguishing the species.

STEMS.—Aside from the winging of the stems by the leaf bases, there are few instances in which other features of the stem are taxonomically significant. The stems are consistently coarse-grooved or sulcate below and become increasingly finer-grooved or striate above. Frequently the basal portions of the stems are anthocyanaceous but this appears to be correlated with the immediate habitat rather than with any specific or subspecific property.

Ordinarily the stems are essentially glabrous in the basal

regions and for most of the total length, but they are somewhat pubescent to semi-tomentose in the regions of the peduncle and occasionally the leaf axils. In *H. flexuosum*, the scattered pilose hairs on both the stems and leaves, and in *H. campestre* the denser pilosity, are taxonomically significant, however, in the otherwise glabrous-stemmed and glabrous-leaved vernal species of *Helenium*.

LEAVES.—Although there are some significant features about the leaves in relation to particular species, the leaf morphology is not a particularly good specific indicator. Such characters as the shape, size, apex, margin and venation are either so variable as to be totally unreliable and overlap in certain species or else are so uniform as to be relatively useless for taxonomic purposes.

A distinction is made as to whether the radical leaves of some species are petioloid or not. The word petioloid is used to indicate that the leaf bases of the rosette leaves are narrowed to form a petiole-like structure but enlarge again within the rosette so as to become clasping. In no case can a definite distinction be made between that portion of the leaf which is blade and that which is petiole. This character serves as a supplementary distinction between *H. pinnatifidum* on the one hand and *H. vernale* and *H. Drummondii* on the other. It is again used to differentiate *H. brevifolium* from *H. campestre* and *H. flexuosum*. Wherever pertinent in the discussion of the synonymy, leaf characters used in establishing previously segregated taxa are discussed.

RESIN.—Small atoms of resin are a characteristic feature of *Helenium* (as well as of many of the other genera of the HELENIEAE.) These are inconspicuous to the eye, merely imparting a sheen to the vegetative parts, but are very evident at low magnifications. These resin atoms are distributed over all the exterior surfaces of the plant, being on the roots to the least degree and on the floral parts to the greatest degree. In relation to the leaves, there seems to be a correlation between the resin atoms and the impressed-punctations that occur on both the upper and lower surfaces. There is a positive correlation between the resin atoms and the degree of pubescence, in that the more pubescent the plant parts are the less abundant

are the resin atoms. These resin atoms appear to be the causative agent for the sneezing associated with *Helenium*, the "Sneeze-weeds." In all probability, the poisoning of sheep and cattle resulting from grazing on *Helenium* and allied genera is related to these resin atoms.

INVOLUCRAL BRACTS.—The involucral bracts are arranged in two distinct series in *Helenium*; the outer series well exceeding the inner. Occasionally, scattered members of a possible third innermost series occur but not consistently enough to be of any taxonomic significance beyond indicating a possible multiserial ancestral condition. Both of the series are foliaceous in nature, with the number of bracts greater in the outer series. The vernal species reflect the progressive trend (from species-to-species) of a decrease in number with an increase in size of the bracts as is exhibited in other portions of the genus. These trends are so tenuous that little emphasis can be placed on them as taxonomic aids, other than their being noticeable trends within portions of the genus.

The characteristics of the involucral bracts have played an important taxonomic role as a generic distinction of *Helenium*. At least one reviser has considered the "reflexed bracts" of *Helenium* to be the primary distinction between it and the genus *Hymenoxys*. Within the vernal portion of the genus this "distinctive" character proves to have been overstressed and optimistically viewed as a generic character for *Helenium*. In such taxa as *H. pinnatifidum*, *H. vernale* and *H. brevifolium* there is little if any determinate reflexure of the bracts at anthesis. When plants of these three taxa are grown under greenhouse conditions, the involucral bract behaviour is far from uniform. Some plants of these three never exhibit reflexed bracts. During the maturation of the achenes some plants of these three taxa may exhibit a slight amount of reflexure, while other plants unquestionably have reflexed involucral bracts. The total range of behaviour, from never reflexed to undeniably reflexed, has been observed in individual plants of the same collection for all three of the above species. At the other extreme, the involucral bracts of *H. flexuosum* are strongly reflexed at anthesis and remain so throughout the cycle of maturity. Other portions of the genus *Helenium* exhibit this range of involucral bract

behaviour to the extent that very little faith can be put in it as a specific character, much less as a generic one.

RAY FLORETS.—The ray florets provide the most direct character in defining the vernal species-group of *Helenium*. In these vernal species, as previously stated, the ray florets are completely devoid of either stamens or style, in contrast to the styliferous rays of the remaining *Helenium* species. The achenes of these ray florets are abortive and sterile. There has been some doubt expressed in the literature as to the constancy of this feature, as evidenced by the placing of *Helenium flexuosum* in alliance with *H. autumnale* and by the reciprocal consideration that the ray florets of *H. autumnale* (as *H. parviflorum* Nutt.) are at times devoid of styles. In no case has the author observed a specimen of *H. autumnale* to be completely devoid of styliferous ray florets or in a state where a decision between it and the neutral and sterile condition is not immediately possible. Admittedly, some ray florets of some heads in *H. autumnale* may be lacking a style, but the frequency is extremely low. Moreover, such a condition could be expected in the natural variability of any species of the *Compositae* that possesses styliferous ray florets. The fact that the achenes of the ray florets in the non-vernal species of *Helenium* mature at a slower rate than those of the disk is probably responsible for a large part of the doubt cast on the validity of the style character. The fact that the style of the ray florets has no true stigmatic portion probably accounts for the slower rate of maturation of the ray achenes. It is much easier to observe the achene and be influenced by it than it is to determine if the ray floret has a style or not. Similarly, it is possible that some ray florets of the vernal species possess styles although no such specimen was observed. There are a few specimens of *H. autumnale* that superficially resemble *H. flexuosum* (less than 1% of the specimens examined) in features other than the sexual state of the ray corollas. These specimens bear styliferous ray florets, however, and it becomes evident that such "questionable" specimens properly belong to *H. autumnale* when all of the morphological characters are examined. Whether these specimens arose by chance hybridizations of the two species or not, thus providing the basis for the resemblance, has not been settled.

However, it is to be noted that many of the commercial cultivated strains of both *H. autumnale* and *H. flexuosum* are propagated not only because they are thrifty in the garden but also, as a result of color "breaks," because they provide an array of color combinations.

The length of the ray corolla could perhaps provide a quantitative index to the vernal species. The ray corollas of *H. campestre* are noticeably longer than those of the other vernal species and those of *H. flexuosum* are decidedly more cuneate than those of the other vernal species. However, the range of overlap and intergradation, in addition to the fact that most specimens are identified in the dry state after severe shrinkage has occurred, makes the ray corolla only a weak supplementary character for identification at best.

One other character of the ray corollas has served in the past as a basis for segregating taxa. In *H. flexuosum*, particularly in portions of the Texas distribution of the species and to a slight degree in central Florida, the bicolor or completely dark red-brown color of the ray corollas (in contrast to the usually wholly yellow color) is noticeable. However, because duplicate collections show many intergrades between wholly yellow and wholly red-brown and because the same plant can have a mixed assortment of ray colors, little reliance can be placed upon such a character.

DISK FLORETS.—The disk florets provide most of the finer distinctions between the species and traditionally have served to indicate specific limits, with the pappus scales playing a particularly important part.

Corolla.—The shape of the corolla is more or less uniform within the vernal species. While there are differences between the species in the total length of the corolla, the range is between 3–5 mm. for most of the species. In *H. flexuosum* the corolla length is 2–3 mm., the shortest for any of the group. The shape of the corolla is more or less infundibular-campanulate except in *H. flexuosum* where the shape is more campanulate with a more pronounced basal tube. The lobing of the corolla provides a character of taxonomic importance. All of the vernal species except *H. flexuosum* are characterized by a 5-lobed apex. In *H. flexuosum*, however, the number of lobes is

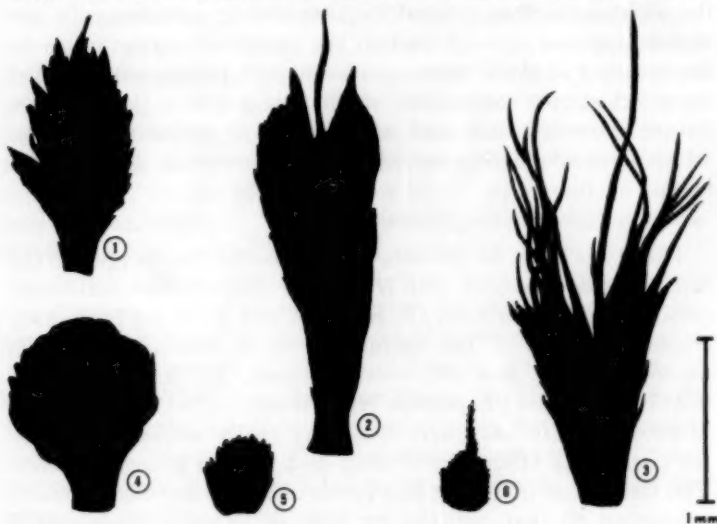
4, rarely 5. This 5- and 4-lobed condition is further reflected in the anthers. In those taxa with a 5-lobed corolla, the number of anthers is 5 and in *H. flexuosum* the number of anthers is only 4. This quadrimorous condition is indistinguishable from the same kind of condition that prevails in the disk florets of the annual-biennial group of *Helenium*, and the presence of such a character in *H. flexuosum* is taken to indicate a relationship between it and the annual-biennial portion of the genus. The exact cause of this condition is uncertain, but it is undoubtedly derived from the wholesale pentamerous state that prevails in the *Compositae*.

The color of the glandular-pubescent lobes of the corolla often is of taxonomic value. In *H. pinnatifidum*, *H. vernale* and *H. Drummondii*, the yellow disk is a constant and reliable taxonomic character. Similarly, the red-brown color of the disk in *H. brevifolium*, *H. campestre* and *H. flexuosum* reliably indicates these taxa. Occasionally, some specimens of *H. brevifolium* and *H. flexuosum* will have a sordid-yellow disk, rather than red-brown, but such specimens are easily placed on other characters.

Pappus.—As mentioned above, the pappus is probably the most used character in the *Compositae* for specific delimitations. While in this revisional study the character of the pappus is used as a specific criterion wherever it is stable and ranges over a rather narrow limit, no attempt has been made to force it to apply as a criterion in those species where it is relatively inconstant and variable. In practice, pappus characters, such as presence of an awn, midrib, overall length and shape and condition of the margin have been found to apply most frequently to species-groups rather than to particular species. Figures 1-6 present representative pappus scales of the vernal species. It must be emphasized that even though the representations are duplications of actual pappus scales, they merely represent an ideal or stereotype for the species. In only one species, *H. Drummondii*, is the pappus scale so characteristic that it serves as a means to identify the species precisely and immediately. The vernal species of *Helenium*, with the exception of *H. flexuosum*, may be distinguished in a general way from the other species of *Helenium* by the number of pappus

scales per achene. In the vernal species the number of scales ranges from 5 to 10, rarely exceeding 10. The usual range, however, is between 6 and 9. This is in contrast to the nearly uniform prevalence of 5 pappus scales per achene in the other taxa of *Helenium*, including *H. flexuosum* of the vernal species. The anomalous behaviour of *H. flexuosum* in this and the other respects noted throughout the morphological characteristics listed here is more fully discussed in the section on relationships.

Achene.—The lengths of the achenes vary over such a narrow range throughout the vernal species, that no stress can be placed



FIGURES 1-6. Representative ideodiagrams of pappus scales. Fig. 1. *Helenium pinnatifidum*. Fig. 2. *Helenium vernale*. Fig. 3. *Helenium Drummondii*. Fig. 4. *Helenium brevifolium*. Fig. 5. *Helenium campestre*. Fig. 6. *Helenium flexuosum*.

on the achene length as a taxonomic character. The shapes of the achenes fall into two classes, columnar and truncate-turbinate, but inasmuch as the two classes overlap and the achenial features are not well-expressed until the achenes are mature, very little consideration is made of them. Such characters as the ribbing of the achenes and the 4- to 5-angled shape (which is obscured in the plump and mature achene) are common in the genus. One achenial feature however, is considered to

be of some taxonomic importance; the absence or presence of hairs. *Helenium vernale* is the only vernal species in the genus that is characterized by having glabrous achenes. Such a constant morphological discontinuity, though it is a character normally considered to be minor, is so stable that it must be considered to be significant and allied to the specificity of the taxon itself. In making a comparison between *H. campestre* and the other vernal species with hairy achenes, the distinction between pubescent and puberulent is made. A verbal comparison between these two terms is hardly easier to draw than the differences that prevail in formulating a universally acceptable species concept and so the usual understanding as to the meaning of these terms, pubescent and puberulent, is relied upon. A simple comparison of the two states as they exist in nature is easily made and no difficulty is encountered as to which term adequately describes the differences in the achenial hairs.

RELATIONSHIPS

There has been no published objection to the merger of the former genus *Leptopoda* with *Helenium*. Such diverse taxonomic personalities as Asa Gray, J. K. Small and P. A. Rydberg have consistently upheld the merger in their various treatments involving the genus *Helenium*. Indeed, A. Gray remarked in 1874 (l. c.) that "*Leptopoda* Nutt. is well united to *Helenium*." Moreover, there has never been any really serious attack on the GALARDIAE offered by Nuttall as a natural group of genera. The treatments involving this group of genera have consistently conformed to that outlined by Nuttall. Cassini supported it enthusiastically, and it was followed in a more restrained fashion and perhaps less explicitly by DeCandolle in the *Prodromus*, Bentham in *Genera Plantarum*, A. Gray in both 1874 and in the *Synoptical Flora* of 1884, O. Hoffman in *Die Natürlichen Pflanzenfamilien* (1897) and Rydberg in the *North American Flora*. The exception to this has been, perhaps, the placement of the genus *Balduina* (including *Actinospermum*). In 1884, Gray, following Bentham, placed *Balduina* in the tribe HELIANTHEAE with the provisional notation "(True affinity rather with the *Helenioideae*.)" Subsequent taxonomists have followed Gray's example and have left *Balduina* in the HELIANTHEAE.

THEAE, apparently more as a tradition than by conviction, for the logical position of *Balduina* would seem to be with *Gaillardia*, which still resides in the HELENIEAE.

The HELENIEAE, as the group stands today, is generally considered to be an artificial tribe in which the admission requirements are a naked receptacle and an uncertain relationship to other genera firmly established in other tribes. Recently there have been a few attempts to abandon the HELENIEAE as a tribe entirely. Cronquist (Am. Midl. Nat. **53**: 478-511. 1955) went so far as to leave the tribe HELENIEAE out of his "Conspectus of the Tribes of the Compositae," and submerged the helenioid genera in the HELIANTHEAE. The reasons offered for this were essentially two: the artificial nature of the naked receptacle and the polyphyletic nature of the HELENIEAE; and the essentially American distribution of the two tribes, HELIANTHEAE and HELENIEAE, the latter being more strictly so. Such a course of action may seem warranted to some, but the GALARDIAE of Nuttall show sufficient similarity in the style branches, anther bases and vegetative characteristics to the INULEAE that sounder basis than that indicated above would appear to be necessary before the abandonment of the HELENIEAE in favor of the HELIANTHEAE would be acceptable.

The vernal species of *Helenium* form a coherent group of species well-marked from the other species of the genus, though, as would be expected, they resemble in many respects the other members of *Helenium*. The characters that serve to define the vernal species are listed below, in contrast to those of the remaining species of *Helenium*.

Vernal species

1. Ray florets neutral and sterile.
2. Pappus scales awnless and obtuse.
3. Vernal flowering habit.
4. Distribution: southeastern U. S.

Other species

1. Ray florets styliferous and fertile.
2. Pappus scales usually awned and/or acute.
3. Aestival or autumnal flowering habit.
4. Distribution: Texas-Mexico, far West or continental.

These characters apply to five of the vernal species in their entirety. *H. flexuosum*, however, while it has neutral and

sterile ray florets, does not conform to the rest of the vernal species in the remaining characters. Morphologically, *H. flexuosum*, apart from the ray character, occupies a position that is intermediate between the vernal species of the southeastern United States and the annual-biennial species of *Helenium* in Texas and Mexico on one hand and the extremely widespread species *H. autumnale*, on the other hand.

(To be continued)

LEGUMINOSAE: NOMENCLATURAL NOTES¹

DUANE ISELY

Schran'ia uncinata Willd. Torrey and Gray (Fl. N. Amer. 400. 1840) took up *Schrankia uncinata* Willd. (Sp. Pl. 4, 2: 1043. 1806) for the leguminous sensitive brier of the central United States and this name was employed by most American authors for nearly 100 years. Standley (Field Mus. Nat. Hist. Bot. 8: 13. 1930) adopted, without discussion, *Schrankia nuttallii* (DC.) Standl. based on *Leptoglottis nuttallii* DC. (Mém. Lég. 451. 1825); *S. uncinata* was relegated to synonymy under *S. microphylla* (Dryand.) Standl.² Most recent authors have followed Standley.

Incident to a consideration of the proper epithet for this species, one finds that two more specific names have been used with reference or possible reference to the plant concerned. These four names have been employed in several binomial combinations (*Schrankia*, *Morongia*, *Leptoglottis*). Their pertinence to the central states sensitive brier is briefly reviewed below.

Mimosa intsia L. Sp. Pl. 522. 1753. Willdenow (loc. cit.) and subsequently Torrey and Gray (loc. cit.) cited *Mimosa intsia* as employed by Walter (Fl. Car. 252. 1788) as a synonym of *Schrankia uncinata*. Examination of Walter's treatment suggests that he probably had reference to the coastal plain

¹ Journal Paper No. J-3121, Project 1073, Iowa Agricultural Experiment Station, Ames, Iowa.

² In making a new combination, Standley apparently overlooked a previous transfer of this epithet to the genus *Schrankia*: *S. microphylla* (Dryand.) McBride (Contr. Gray Herb. 59: 9. 1919), based on *Mimosa microphylla* Dryand. (In Smith, Geo. Insect. 2: 123. 1797).

species *Schrankia microphylla* (Dryand.) McBride. Furthermore, his name is a misapplication of an earlier Linnaean binomial for an oriental species, which as McBride (op. cit.) has said "indeed bears a superficial resemblance" to *Schrankia microphylla*.

Mimosa horridula Michaux (Fl. Bor. Amer. 2: 254. 1803) has variously been referred to *Schrankia uncinata* or *S. microphylla*. Most recently it was assigned to *S. microphylla* by Merrill (Castanea 13: 69. 1948)—no reason given. McBride (op. cit.) stated that it was not clear from the description whether reference was to *Schrankia uncinata* or *microphylla* and, therefore, the name should be discarded since certain identification seemed impossible. Through kindness of the curator of the Paris Museum, I have been able to borrow the original Michaux sheet.³ It is *Schrankia microphylla*.

Schrankia uncinata Willd. (loc. cit.) has recently been taken up by Gambill (Leg. Ill. 3. 1953) on the basis that the original description appeared to refer to the species of the north-central states. This interpretation, contrary to the earlier viewpoint expressed by Standley (loc. cit.), is based on the fact that in *S. uncinata* (*nuttallii* of most current authors) the veins on the lower side of the leaflets are raised and distinct; in *S. microphylla*, usually only the midnerve is discernible and it is nearly plane. Willdenow (loc. cit.) referred to the leaflet venation as "subtus elevatovenosis." To definitely ascertain the identity of Willdenow's material, a photograph of the specimen and fragments of the leaflets were recently obtained through cooperation of Dr. D. E. Meyer, Botanischer Garten und Museum, Berlin-Dahlem. The leaflets are plainly nerved; the specimen is our central states *Schrankia*.

DeCandolle's *Leptoglottis nuttallii* (loc. cit.) some 19 years later than *Schrankia uncinata* Willd., contains several ambiguities but probably also refers to this same species. The description relates to a specimen collected by Nuttall in the Arkansas territory which was seen in the herbarium of M. Mercier. This specimen did not possess pods and DeCandolle was uncertain as to whether it should be affiliated with *Desmanthus* or

³ Photographs of this specimen have been prepared and deposited in the Gray, Chicago Museum, and Iowa State College Herbaria.

Schranksia. He concluded by provisionally describing it as a new genus ("Je le décrirai provisoirement comme un genre particulier"). Then follows a description of the genus *Leptoglottis* moderately definitive for our plant except for the statement "Flores albi" (possibly to be attributed to poor condition of the material).

The proper binomial for this species would appear to be *Schranksia uncinata* Willd.

AUTHOR CITATION FOR THE GENUS ACACIA

The genus *Acacia* is variously attributed to the following authors in current literature: *Acacia* L.; *Acacia* (Tourn.) Mill.; *Acacia* Willd.; *Acacia* Mill.; *Acacia* Adans. In consulting Kew Index one finds *Acacia* (Tourn.) L.

Linnaeus attributes the genus to Tournefort and it is to be found in Tournefort, *Institutiones Rei Herbariae* 1719 (p. 605 in the written text; table 375 in the illustrations). However, Tournefort and other pre-Linnaean authors may be disregarded for purposes of priority.

Linnaeus did not employ the name *Acacia* in the first edition of *Species Plantarum* (1753), in the second (1763), or in any of the editions of *Genera Plantarum* (1737, 1742, 1743, 1752, 1754, and 1764). In both publications the genus is submerged under *Mimosa*; in *Genera Plantarum*, *Acacia* Tournefort is cited as a synonym of *Mimosa*. Linnaeus, however, used *Acacia* in a generic sense in his *Flora Zeylanica* 217. 1747, and it is possibly from this treatment that his name is associated with genus. However, since this is prior to 1753, the Linnaean genus *Acacia* has no standing in present nomenclature.

Subsequent to 1753, the name appears to be first employed by Miller (Gard. Dict. Abr. Ed. 4 Vol. 1, 1754). Twenty-four species are enumerated and discussed following a generic diagnosis. Some botanists, however, have referred the genus to subsequent authors (e.g. Adanson, Fam. 2: 319. 1763; Willdenow Sp. Pl. 4, 2: 1049. 1806). Perhaps this is because the binomial system of nomenclature is not consistently used in this particular edition of Miller's Handbook. For example, most of the species of *Acacia* discussed are presented as polynomials. However, although the Rules specifically state (Article 79) that specific

and infra-specific epithets are illegitimate when published in works in which the Linnaean system of binary nomenclature for species is not consistently employed, no such requirement is stipulated for generic diagnoses (Article 78). The correct citation would appear to be *Acacia* Mill.—DEPT OF BOTANY, IOWA STATE COLLEGE.

VERNONIA CRINITA IN ILLINOIS.—Recording the occurrence of this species of Compositae seems desirable, as it has not been previously reported to have been found growing in Illinois, and the few plants that are known to occur here will soon be exterminated. In the Herbarium of the University of Illinois there are the following two collections from eastern Illinois. CHAMPAIGN CO.: at edge of road west of Champaign about a quarter of a mile south of the Champaign Airport, August 3, 1955, *J. P. Slimmer 111* (plants immature); September 18, 1955, *G. N. Jones 20598* (plants in full flower).

Both collections were made at the same place. There are about a dozen plants on a narrow roadside strip of prairie bordering a field. Here they appear to be making their last stand. These plants are almost certainly native. That they might have been planted in that place is out of the question, and there is no sign that they are adventive. The nearest known native occurrence of this species is in central and southern Missouri (Palmer & Steyermark, 1935, *Ann. Mo. Bot. Gard.* **22**: 654), more than two hundred miles southwest of Champaign County, Illinois. The range of the species includes Kansas, Oklahoma, and Arkansas, although Gray's Manual, where the species is described and well illustrated, reports it as adventive in Ohio.—GEORGE NEVILLE JONES, UNIVERSITY OF ILLINOIS.

A NEW AMELANCHIER OF EASTERN CANADA

FATHER LOUIS-M. LALONDE

THERE is no doubt that M. L. Fernald's statement in *RHODORA*¹ that "no genus of the Rosaceae in North America, except of course *Rubus* and *Crataegus*, has offered so much perplexity and has had such contradictory treatment as *Amelanchier*"

¹ Fernald, M. L.—A Monograph of *Amelanchier*. *RHODORA* **48**: 129-134, 1946.

is still painfully true, especially for the material collected in the Province of Québec. The herbarium specimens of Ernest Lepage, from northeastern Québec (mainly from Rimouski and the counties of Gaspé Peninsula), recently sent to American specialists came back with question marks on nearly 25 per cent of the revision labels, also with a few hybrid marks! The material in our Oka Institute herbarium, mainly from southwestern Québec, checked by Wiegand and Fernald, also carries marks of "perplexity", as in this note: "Find this 3693 difficult to name at this stage as it seems unlike any species that ought to be found in that region. Would like to see more mature material also. . . Are there many individuals all alike? . . ."—Just to mention one of our interesting problems, there are in or quite close to the Oka Pine Barren, described elsewhere,² half a dozen species of *Amelanchier*; among them that Wiegandian pair of "common and widespread small serviceberry" *humilis* and *stolonifera*—dominant and characteristic in this rapidly disintegrating formation as far as *Pinus Strobus* is concerned.—But here the trouble starts, for, while our *A. stolonifera* is oxylophytic and follows correctly the description in the manuals, being 3–12 dm. high, stoloniferous in loose colonies, its leaves of the right shape with sharp teeth running much below the middle, our *A. humilis*, incorrectly enough is not calcicolous, growing with *Kalmia*, *Arctostaphylos*, *Gaultheria*, *Gaylussacia* and *Vaccinium*. Erect and fastigiate, often 6 to 8 ft. high, with very truncate, coarse toothed, oval-oblong to orbicular, dull dark green leaves, this plant looks quite like Lamarck's *A. spicata*, as photographed by B. G. Schubert, after Alfred Rehder (RHODORA 48: plate 1027, 1946), and after all probably brought two centuries ago from Canada. Surely it looks like Prof. G. N. Jones' *A. spicata*! By its leaves, this species seems also near to the western *A. alnifolia* Nutt. (w. Ontario to Yuk., s. to nw. Ia., Nebr., Colo. and Oregon), but its raceme here is ten-flowered.³

² Louis-Marie, P.—Parallèle entre les pinèdes du New Jersey et celles du Québec. Revue d'Oka 27 (6): 159–165, 1953.—La structure de la végétation d'Oka, P. Q., Canada. Rev. d'Oka 27 (2): 29–40, 1953.

³ What ever comes out of this Oka *A. humilis*, (fide Wiegand and Fernald), it would not be surprising if the living *Amelanchier* transplanted in Paris, dans le Jardin du Roi, coming from Nouvelle-France of the XVIII century, had not been unrooted from this long Pine-barren along the northern side of the Two-mountain Lake, only a few miles distant from Ville-Marie (Montreal), just facing the western end of Montreal Island where stood a military fort and a trading post.

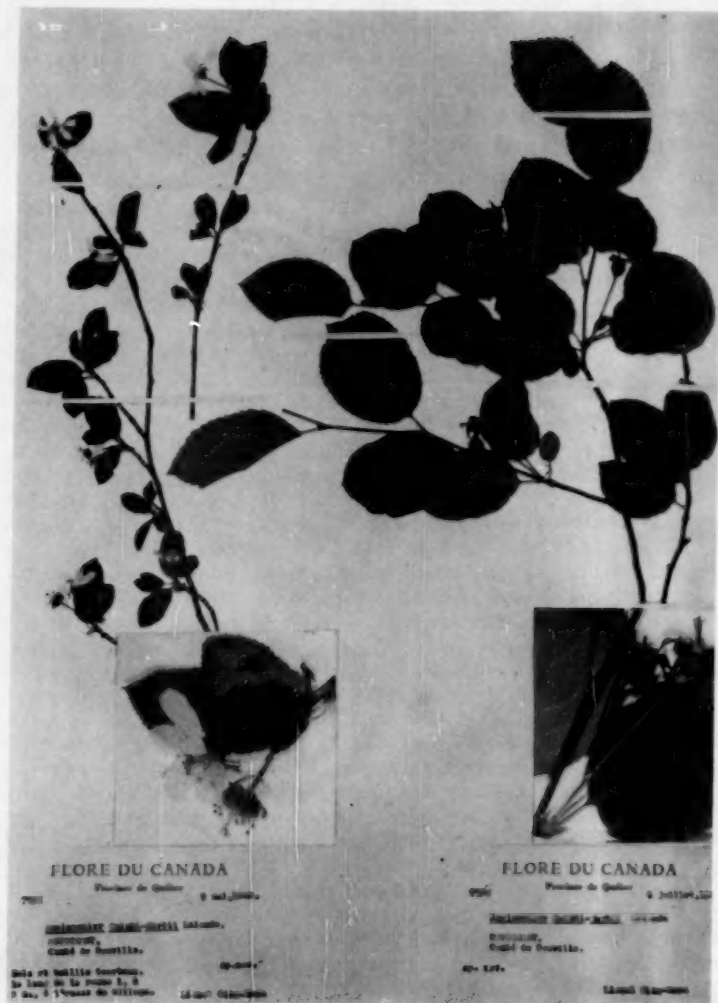


PLATE 1228. Type sheet of *Amelanchier Quinti-Martii*.



In southern Québec too, several apparently new types have been collected and, after years of observation in the field, are now being studied seriously by young Amelanchierist of this Province, Lionel Cinq-Mars for whom I name the following new species, initially labeled *A. × Bartramiana*, found by him in the region of Rougemont (Rouville County).

Amelanchier Quinti-Martii Lalonde, sp. nov.—Frutex vagans, stoloniferus, 1–3 m. altus.—Gemmae terminales 6–8 mm. long., 2.5 mm. lat., perulae squamis rubro-fuscis, viriditinctis in margine pilosisque prope basin, inferioribus squamis tridentatis.—Folia, cum conduplicata prefoliatione, semi-evoluta per anthesim sparseque pilosa; novae laminae plus minusve aeneae et adhuc cum raris pilis superius, inferius dense sericeo-pubescentes; maturae laminae firmae et luridae, glabrae superius, paulo griseae inferius cum pilis in nervo mediano; petioli pubescentes, 5–10 mm. long.; laminae rami floriferi ovatae, raro ellipticae vel obovatae, breviores in ramis sterilibus, 2–3.5 cm. \times 3–4.5 cm. long., apice breve acuminatae, basi rotundatae vel acutae, argute et oblique serratae, cum 5–12 dentibus per cm., usque sub medio vel usque ad basin; ad venis primariis 7–12-jugis, irregularibus et ad marginem reticulatis.—Flores 2–3, cymose insertae, pedicellis pubescentibus etiam in fructu, 15–25 mm. long.; petalis elliptico-obovatis, 9–13 mm. long., 5–6 mm. lat.; sepalis triangulis et longe acutis, laxe reflexis; hypanthio 3–6 mm. diam., crateriformi, glabro intus et tomentoso exterius; summo ovario potius convexo denseque lanato.—Fructus fere caeruleus, globosus, adhuc sparse pubescens, 10–15 mm. long., 8–12 mm. diam.; sepalis rubris, utroque pilosis, erectis vel revolutis; ad maturitatem farinosus et insipidus.

Bushy shrub 1–3 m. high, stems solitary or few together, spreading by subterranean offsets. Terminal buds 6–8 mm. long, 2.5 mm. wide; lateral buds smaller; the center of buds' scales reddish brown, margins paler with a green tinge and hairs exserting from below, even on the lower scales; lower scales broadly 3-toothed, the two outer teeth sharper; no conspicuous veins on the scales. Leaves folded or conduplicate in bud, halfgrown at flowering time, remaining folded for some time after emerging; sparsely pilose, deep green and somewhat bronze on upper surface when young, densely silky-pubescent on lower surface; bronze brownish color of leaves very conspicuous during and sometime after anthesis; mature leaves thick, lustrous, and glabrous on upper side, grayish and with few hairs mostly along the midrib on the lower side; petioles permanently pubescent, 5–10 mm. long; mature blades on fertile branchlets ovate, elliptic to obovate, those on sterile branchlets more rounded or short acute, 2–3.5 cm. \times 3–4.5 cm. long; apex rounded to short acuminate; base rounded to short acute; margin sharply serrate to below the middle or nearly to the base; teeth usually abruptly and obliquely sharp acuminate from a broad base, 5–12 teeth per cm.; sinuses of the teeth sharp; primary lateral veins very prominent and conspicuous on both sides of the leaves, 8–12 on each side of the midrib, irregularly distant with occasionally short intermediary veins, anastomosing and

indistinct in the outer third of the leaf blade. Inflorescence cymose or with 2-3 terminal flowers. Pedicels very pubescent at flowering time, less so when the fruit is ripe, 15-25 mm. long. Petals elliptic to obovate, 9-13 mm. long, 5-6 mm. broad. Sepals triangular long acute, sometime with subulate tips, loosely spreading, 3-4 mm. long; persistently tomentose on both sides. Hypanthium 3-6 mm. in diameter, cup-shaped or deeply saucer-shaped, glabrous inside, copiously tomentose outside; ovary summit densely woolly; base of the style abruptly inserted on the rounded or somewhat flattened summit of the ovary. Fruit blue, globose and plump, retaining some pubescence on its surface, 10-15 mm. long, 8-12 mm. in diameter, with the hairy sepals reddish or pale in color, erect or irregularly revolute; mealy and rather tasteless when ripe.

This new taxon is intermediate between *A. Bartramiana* Wieg. and *A. arborea* (Michx. f.) Fern. and was found at Rougemont, Rouville County, Québec (lat. 45° 25', long. 73°) in partly dry bog, woods and thickets, with *Viburnum cassinoides*, *Pyrus melanocarpa*, *Betula populifolia*, *Pinus Strobus* and the bog Ericaceae.—Type: *Lionel Cinq-Mars 11*; in flower, May 9, 1955, fruct. July 4, 1955. Type in the Ottawa Central Experimental Farm herbarium. All the typical material distributed under No. 11 in flower or in fruit, was collected on the same plant in 1955. Since then, this species has been found in the same kind of habitat at three other stations in Rouville County and in the Sherbrooke area some 70 miles away.

A. Quinti-Martii, intermediate between *A. Bartramiana* and *A. arborea*, differs sharply from both in the following characters:

<i>A. Bartramiana</i>	<i>A. Quinti-Martii</i>	<i>A. arborea</i>
Cespitose, fastigiate slender shrub; 0.5-2.5 m. high.	Stems solitary or few together from subterranean offsets; 1-3 m. high.	Fastigiate, solitary or few together; 5-20 m. high.
Young leaves light green and glabrous.	Deep brownish green, not glabrous.	Green not brownish, nor glabrous.
Petiole short, 2-7 mm. glabrous or glabrescent.	Permanently pubescent, 5-15 mm. long.	Pubescent when young, longer than 15 mm.
Inflorescence, cymose with 2-3 terminal flowers.	Cymose, 2-3 flowers.	Raceme 3-5 cm. long, nodding.
Petals 6-9 mm. long. Style divided to its base or nearly so.	Petals 9-13 mm. long. Divided to $\frac{1}{2}$ of its length.	Petals 10-14 mm. long. Divided very little, about $\frac{1}{6}$ of its length.
Ovary summit conical and woolly.	Somewhat rounded and woolly.	Almost flat and glabrous.

NOTES ON ILLINOIS GRASSES

JOHN W. THIERET AND ROBERT A. EVERS

THE following records and data have been accumulated during 1956. Specimens cited (F) are in the herbarium of the Chicago Natural History Museum; those cited (ILLS) are in the herbarium of the Illinois State Natural History Survey at Urbana.

1. ADDITIONS TO THE GRASS FLORA OF ILLINOIS

Agropyron desertorum (Fisch.) Schult. (determination verified by Dr. Jason R. Swallen). This wheatgrass was collected in the Milwaukee Road classification yard at Bensenville, Cook County, Illinois, August 9, 1956, *Thieret 2295* (F, ILLS).

2. ADDITIONS TO THE GRASS FLORA OF THE CHICAGO REGION

Distichlis stricta (Torr.) Rydb. Two thriving colonies of desert saltgrass—a species collected but once previously in Illinois, near Urbana—were found in the Milwaukee Road classification yard at Bensenville, Cook County, Illinois, August 8, 1956, *Thieret 2232* (F, ILLS).

Aegilops cylindrica Host. Goat grass was collected in the Milwaukee Road classification yard at Bensenville, Cook County, Illinois, August 9, 1956, *Thieret 2294* (F, ILLS).

3. MISCELLANEOUS NOTES

Erianthus ravennae (L.) Beauv. On the basis of a single collection, this cultivated ornamental grass is reported by Jones and Fuller (Vascular Plants of Illinois. Ill. State Mus. Sci. Ser., vol. 6, 1955) as spontaneous in Illinois. The following additional collections have been made near Chester, where the species shows a definite tendency to become naturalized: spontaneous (according to nearby homeowner) in road right-of-way along route 3, 0.7 mile north of north edge of Chester, Randolph County, Illinois, September 26, 1956, *Thieret 2778* (F);—spontaneous in road right-of-way along route 3, 2.1 miles north of north edge of Chester, September 27, 1956, *Thieret 2783* (F);—spontaneous according to local housewife, at least 50 flowering stalks, about 15 clumps, colony along route 150 at edge of field opposite house number 1705, east of junction of routes 3 and 150, Chester, September 27, 1956, *Thieret 2784* (F).

Agropyron dasystachyum (Hook.) Scribn. In Mosher's The Grasses of Illinois (Univ. of Ill., Agr. Exp. Sta. Bull. 205. 1918.) and in Jones and Fuller (op. cit.), this species is attributed to Illinois on the basis of the following collection: C. & N. W. R. R., west of Turner, Du Page County, Illinois, W. S. Moffatt 231, June 26, 1897 (F; also Univ. of Ill. Herb.). Thickspike wheatgrass is also attributed to Illinois in Hitchcock-Chase (Manual of the Grasses of the United States. USDA Misc. Publ. 200. 1950.), presumably on the basis of the Illinois specimen labelled *Agropyron dasystachyum* in the herbarium of the United States National Museum: on ballast, West Chicago, Illinois, June 26, 1897, L. M. Umbach, no number (also in F). Both the Moffatt and Umbach collections are better referred to *Agropyron smithii* Rydb. var. *molle* (Scribn. & Smith) Jones, a taxon not cited in Jones and

Fuller (*op. cit.*) and one that cannot be "keyed out" in Fernald (Gray's Manual of Botany, 8th ed. New York, 1950). There are no authentic Illinois specimens of *Agropyron dasystachyum* in the herbarium of the Chicago Natural History Museum, of the Illinois State Natural History Survey, of the United States National Museum, of the University of Illinois, of the Missouri Botanical Garden, or in that of the University of Wisconsin. Therefore, until this species is actually collected in Illinois, it must be excluded from the state flora.

The following data for culm height of several taxa are given because they exceed by a considerable margin the maximum height given for these in Hitchcock-Chase (*op. cit.*) and/or in Fernald (*op. cit.*).

Andropogon gerardi Vitman.—Evers found and measured culms 3.0 meters tall from a rolling prairie remnant, about seven miles south of Camp Point, Adams County, Illinois, September 14, 1956. This site, which had not been cultivated for a quarter of a century, has reverted to a type of big bluestem prairie. It has been accidentally burned on several occasions. It is pastured in early summer, but the cattle shun the tall grass by late summer and autumn. (Hitchcock-Chase, 2 m.; Fernald, 1.5 m.).

Erianthus ravennae (L.) Beauv., 4.57 m., Thieret 2777 (F), lawn specimen, Chester, Randolph County, Illinois. (Hitchcock-Chase 4 m.; Fernald 3 m.).

Sorghum vulgare var. **drummondii** (Nees) Hask. ex Chiov.—Plants of this sorghum were growing in a cornfield along the banks of the Ohio River at Backus Landing, east of Grand Chain, Pulaski County, Illinois, September 11, 1956. The plants were as tall as, or taller than, the corn (*Zea mays* L.) in the field. Measurements made by Evers showed the plants to be 3.1 m. tall. (Hitchcock-Chase, 2 m.).

Spartina pectinata Link.—Prairie cord grass grows quite tall in suitable sites in Illinois. A photograph in the Illinois Natural History Survey Bulletin 13 (16): Pl. L., 1921, shows this grass as high as a buggy top, the vehicle needed by the botanist at that time in that section of the state when the roads were poor. On October 3, 1956, Mr. Hugh Cunningham, a member of the Survey staff, brought in a culm of prairie cord grass that measured 3.3 m. tall. This sample was collected along the Illinois Central R. R. south of Champaign, Champaign County. (Hitchcock-Chase and Fernald, 2 m.).—CHICAGO NATURAL HISTORY MUSEUM AND ILLINOIS STATE NATURAL HISTORY SURVEY.

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DUPLICATE BOOKS FOR SALE

These books have library book plates and are used copies, some worn, some in need of binding.

ALLIONI, C. <i>Flora Pedemontana . . . Augustae Taurinorum</i> , 1785. 3 volumes in one. 92 plates. Folio.....	\$50.00
HALLER, A. VON. <i>Icones Plantarum Helvetiae</i> . Bernae, 1813. 52 plates. Folio.....	30.00
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